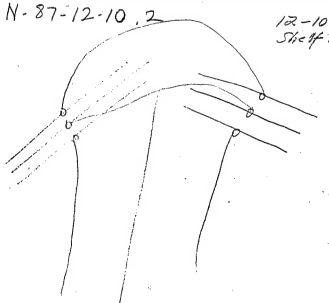
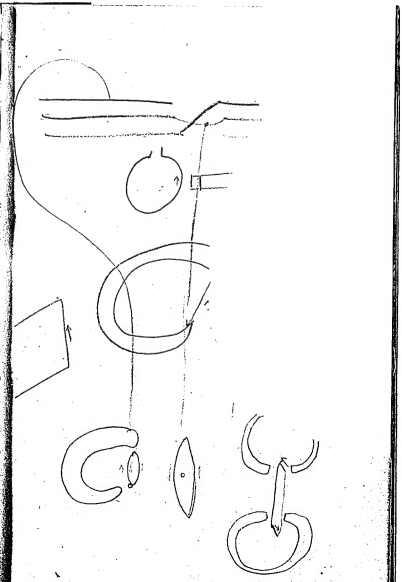
Notebook, N-87-12-10.2

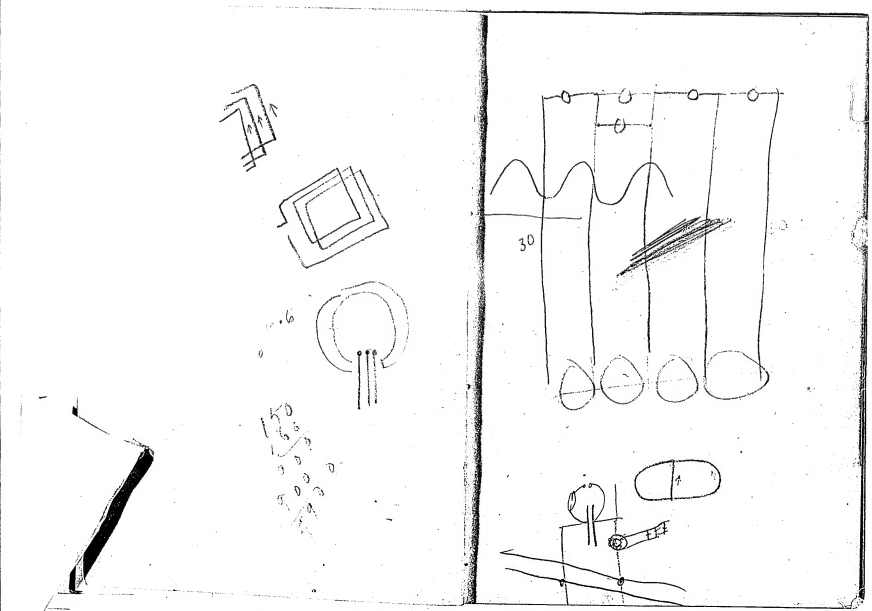
This notebook covers the period December 1887-November 1888. All entries are by Edison. Included are several notes to John Ott, written about December 12, 1887, in regard to proposed experiments on a pyromagnetic generator, arc lights, telephones, batteries, carbonization, and the use of a thermostatic meter strip as a meter, as well as experiments to "ascertain if there is any substance which stands the lines of magnetic force." There are also some drawings of the phonograph dating from September and November 1888. The remaining entries are undated and consist of notes on experiments to determine whether iron "is a non conductor of electric stress." Some of these notes also contain Edison's speculations about the electromagnetic properties of the ether. The pages are unnumbered. Approximately 120 pages have been used.

N-87-12-10.2

12-109
Sheet 2



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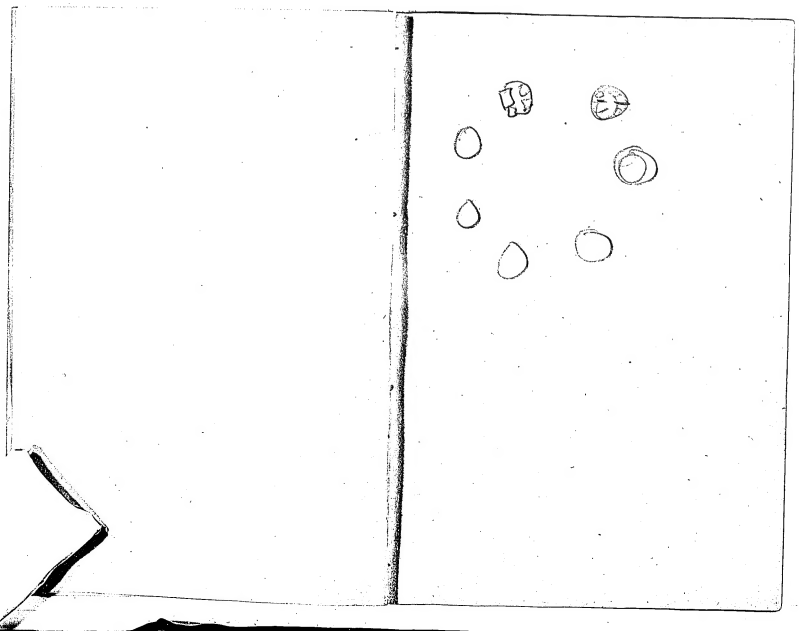
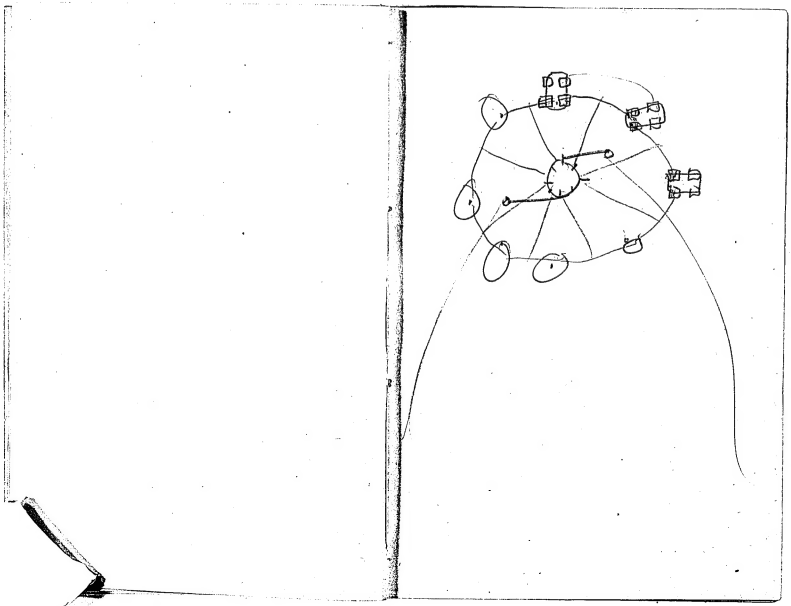
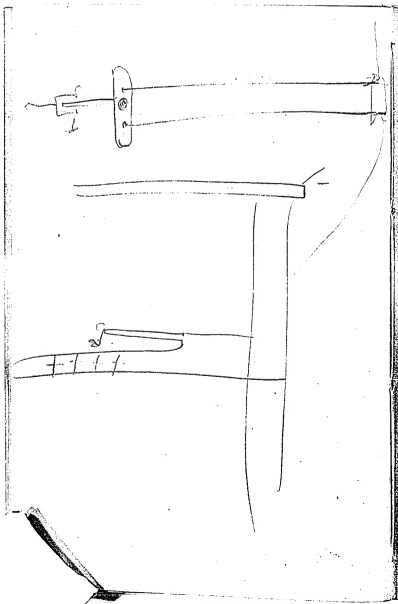


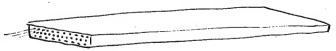




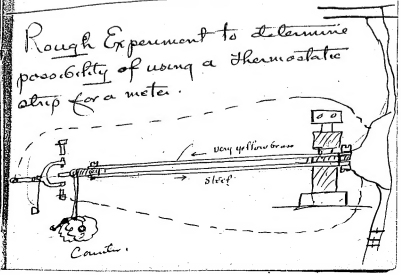
Orange N J Dec 10/87

John –

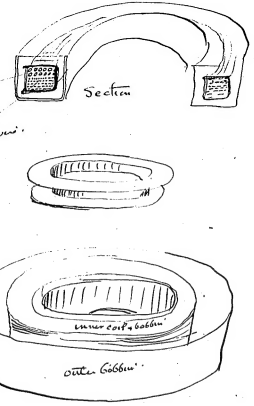
When the hydraulic press is set up mould some forms with say 1⅛/1000 Copper wire in middle, we can eat this out by acid, Hydrochloric & this will leave a straight hole & the form can be carbonized –

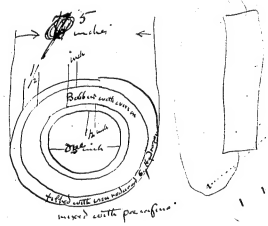


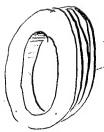
Rough Experiment to determine possibility of using a thermostatic strip for a meter.



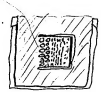
Make a Telephone induction coil thus





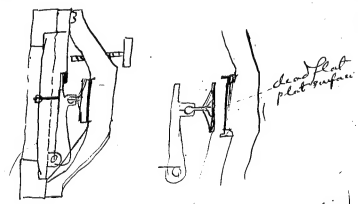


bobbin with wire on
This sets in another
bobbin so there is 1/2 inch
of powdered iron mixed with
paraffine all round it.



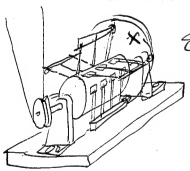
End View of whole coil
Cut in Two

Make a telephone Transmitter.



platinum surface dead flat.

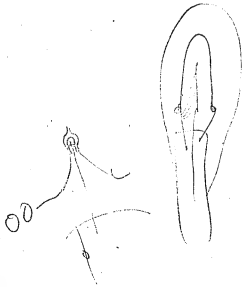
Ferrotyple plate free at Edges – Edges of frame where diaphragm touches heavy ~~shellac~~ Coated with Rubber varnish diaphragm very flat so it touches all around Edges – I propose to use disk of lamp black same diameter as old button but only 5/1000 thick – Everything perfectly rigid like phonographic Recorder



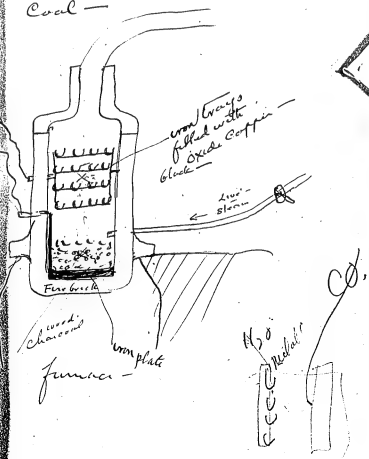
Electrifying Battery

a Cylinder of a brass tube ~~with~~ perfectly true & highly polished - diameter Cylinder 3 inches. 3½ long - run very rapidly by a Belt. There are 4 sets of 3 each springs secured to metal rod that all connect together on a rubber or metallic disk X which is insulated from the revolving Cylinder & Base - all the rubbing springs are connected together while the Cylinder forms the other pole - on the Ends of those rubbing springs are soft leather pads pressing about 1 square

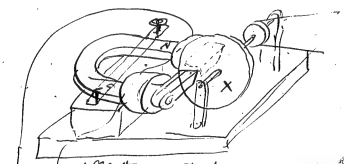
inch of surface, The surface of the Leather is covered with pure tin foil. which makes electrical contact with the springs — The rubbers should be arranged to be easily disconnected as I desire to cover the leather with many kinds of metallic foil — The pads should press only just hard Enough on the cylinder to insure contact & as much surface as possible — When Instrument all ready shellac the cylinder with a very thin coating of shellac ~~&~~ less than $\frac{1}{4}$ of a thousand thick, perhaps this can best be done evenly by dipping it in Solution then heat it so as to harden shellac, Then I will be ready to try some Experiments with it —



Experiment for obtaining ~~Heat~~ Electricity direct from Carbon or Coal —



Experimental apparatus to ascertain if there is any substance which retards the lines of magnetic force.

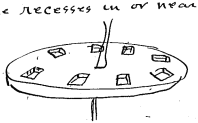


① 1 cell Battery or multiple

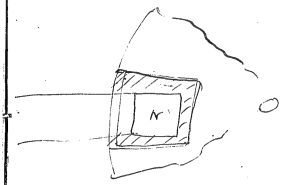
Telephone

X is a disk of hard rubber 6 inches in dia - $\frac{1}{4}$ thick - & exactness

There are recesses in or near the Edge



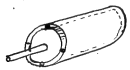
These square places are about $\frac{1}{8}$ deep + about inch square



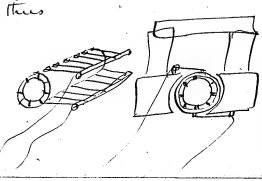
I fitt these places which do not go clear through with various substances They have a sliding cover so that when they are fitt I slide the cover in them

by rapidly rotating the disk and the several Chambers being filled with different material if any the substance retards or obstructs the lines of force, it will send several waves into the Coils around the magnet & be heard in the Telephone - I want the chambers to pass at such a speed that 200 will pass in a second but 100 would answer probably -

Take a No 1 Dynamo 20 ampere, use the armature without any wire, over this but insulated by an air space put a hard rubber Cylinder polished on the outer surface,



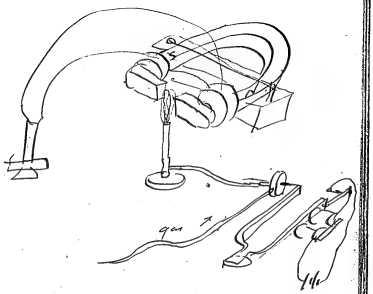
arrange about 20 springs with leather pads on end covered with foil - thus



I want to carburize about 25 or 30 materials at once so I can test the Carburizing properties of several hundred substances at once

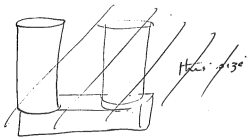
make 6 Carbon plates from battery Carbon 6 X 6 1/2 to 3/4 thick - Sink holes in it 1/2 inch diameter & to such a depth as will leave 1/8 stock at bottom, put these holes at such a distance apart as will leave a wall of 1/2 inch between the adjacent hole By filling these holes with diffrent substances & placing one form on top of the other I can Carburize a lot of things & then study the Carbon produced & the amount —

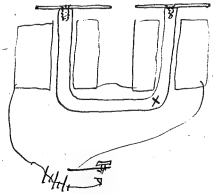
Set up in galvanometer Room on floor slate pier - The magnetic pendulum Tripod & appliances



Vibrate flame in magnetic field see if get sound in Telephone =

Make



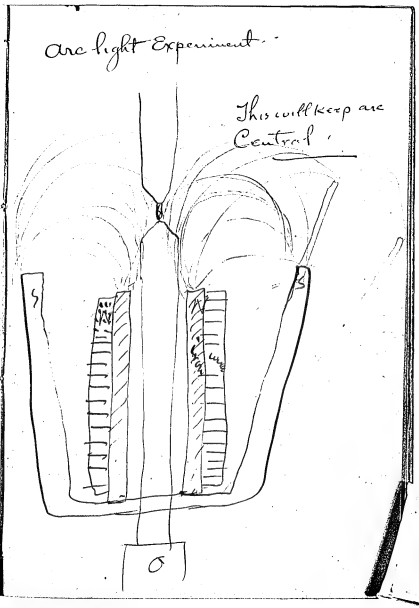


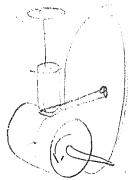
Cores X with disks that can be screwed on of all the following metals

Lead – Tin – Antimony – Bismuth,
Copper – Zinc – Cadmium – Brass,
platinum – Cerium – Silver.
Carbon –

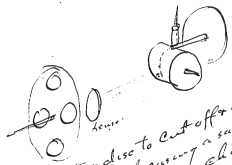
If want to coat the surface of the disks with various materials

Arc light Experiment.



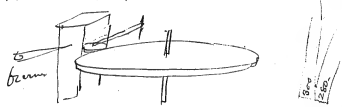


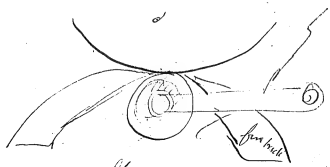
Devise apparatus —



Rotating disc to cut off one the light, focusing a sun beam on rotating chalk cylinder should effect the capillarity & beheard inhibition.

Design a good apparatus for thermo experiments same as we had down to Florida —



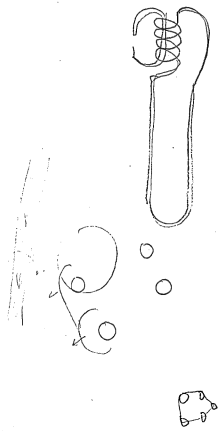


flow

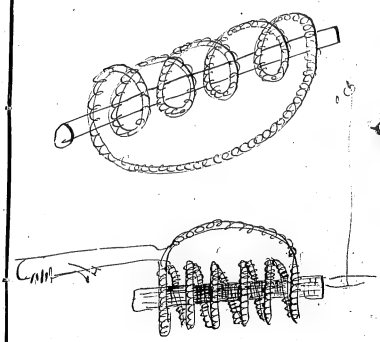
.35.

Make large disks of following also small disks — Cast iron — Wrought iron — Copper Lead Zinc Tin, German silver (Silver small) Cadmium — Bismuth — antimony — Brass yellow — Brass Red — pure nickel — Cobalt, Platinized nickel

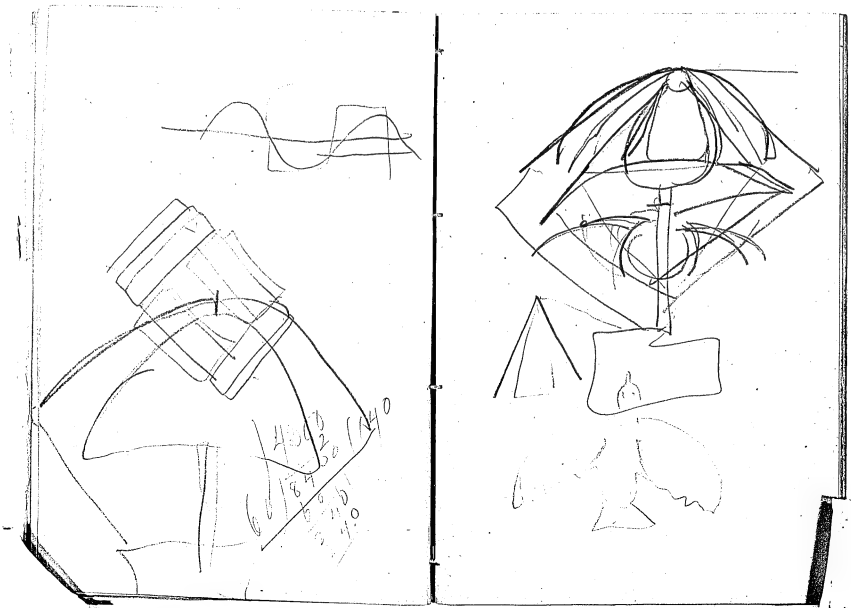
Talk to me about this before doing anything

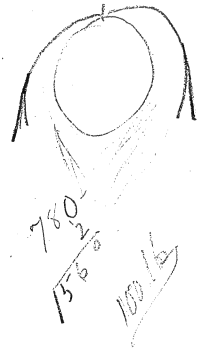


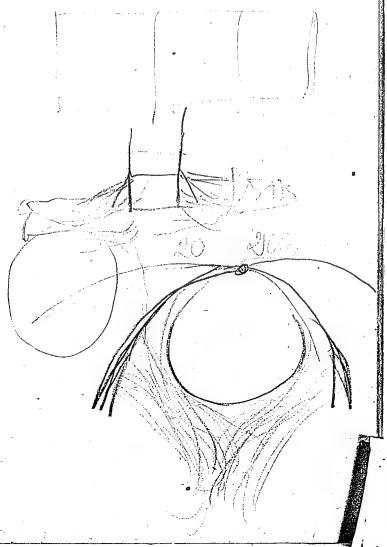
Experimental Apparatus

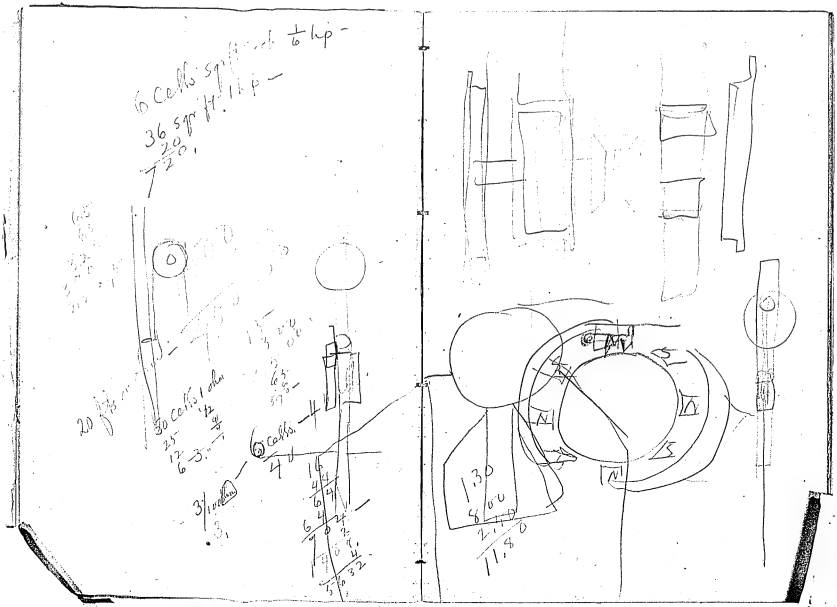


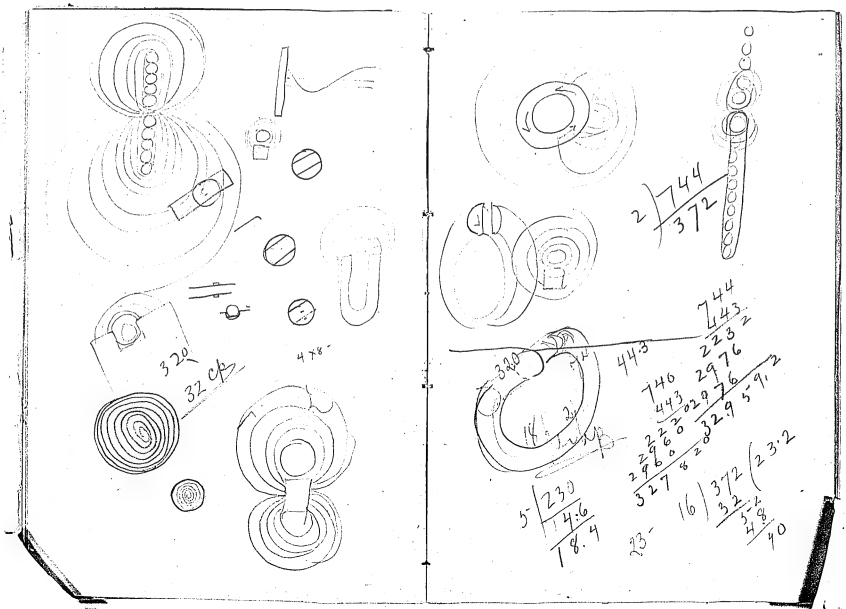
About 10 feet of soft $\frac{1}{8}$ iron wire wound with No 22 or 23 silk covered copper wire - begin it dont make contact with iron - leave 1/2 inch hole in center to put various metals.




780-
15-5
100 lb




6 cells
36 sq ft
20 ft
30 cells
6 cells
1.30
8.00
2.10
11.80



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16 | 372 (23.2
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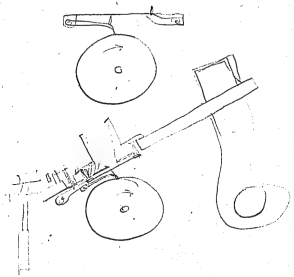
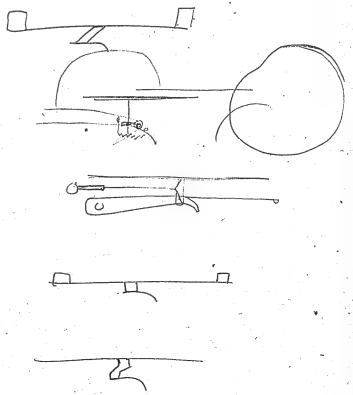
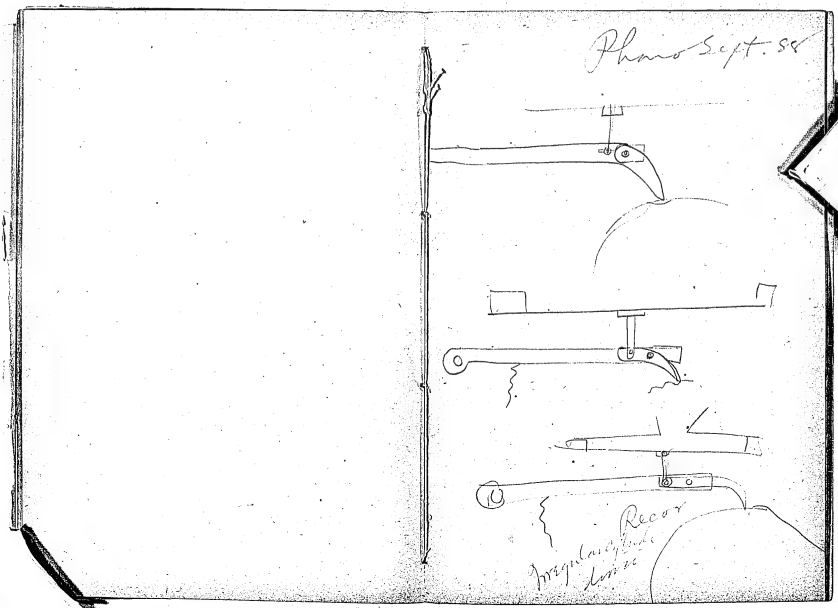
48
40

Phonograph Sept 1 1888

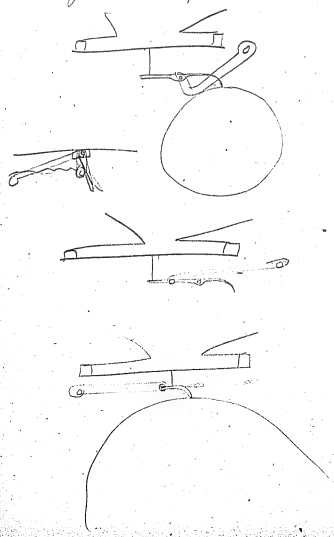


Plumo Sept 1 '88

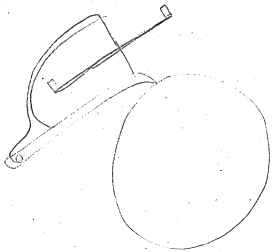


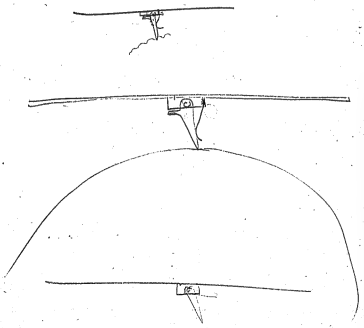

Phono Sept. 58
Recor

Phono Sept 1 88

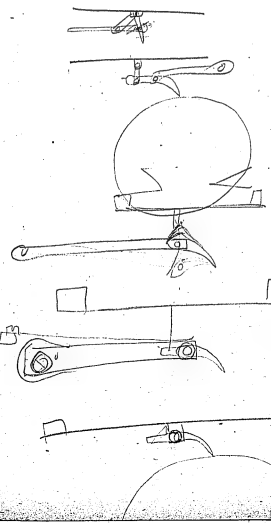


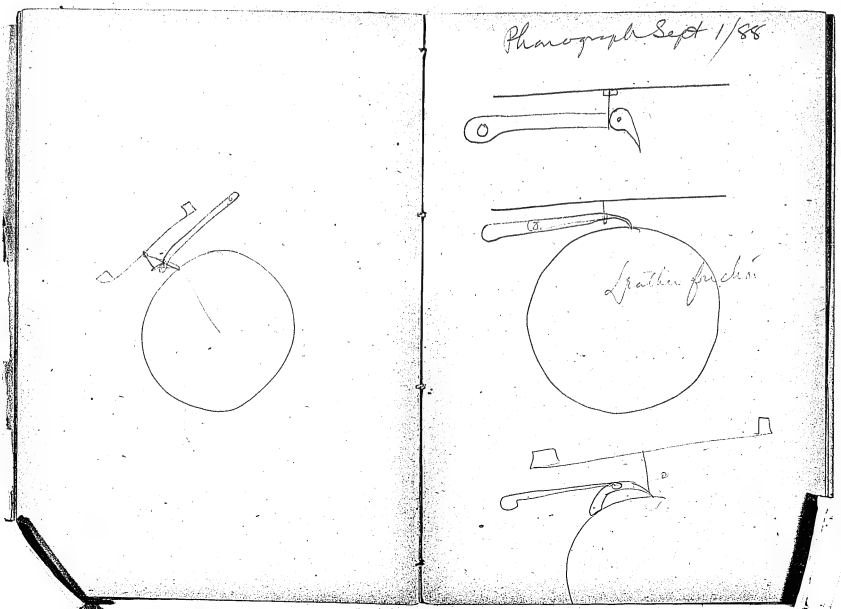
Plumoth Sept 1/88

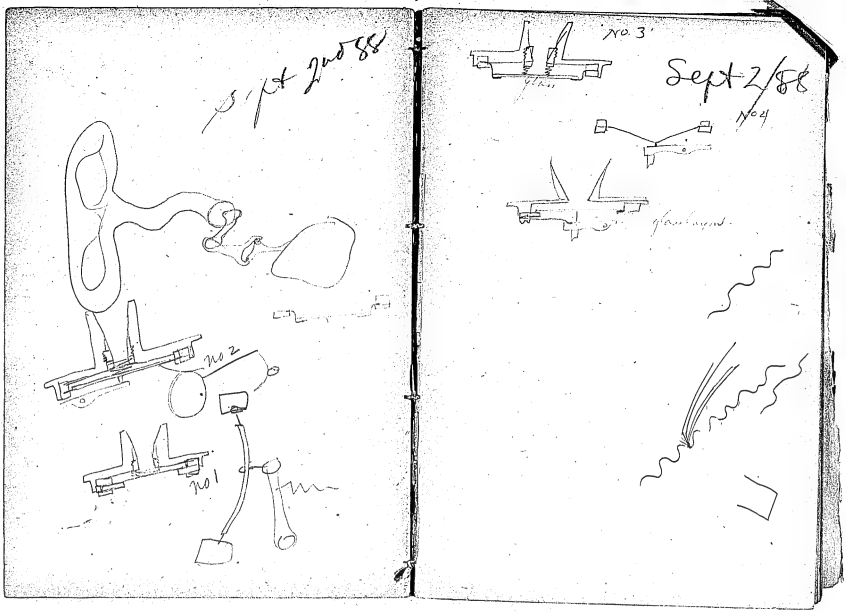




Plough Sept 1/88




Phonograph Sept 1/88
Leather faced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Sept 2/88
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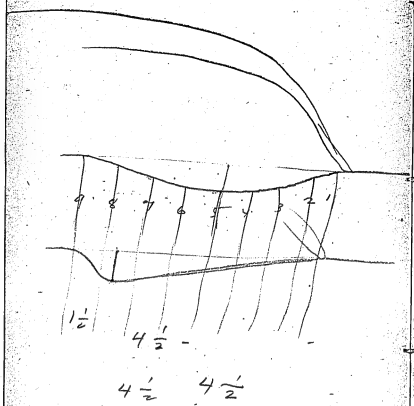

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5

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108.0

32.

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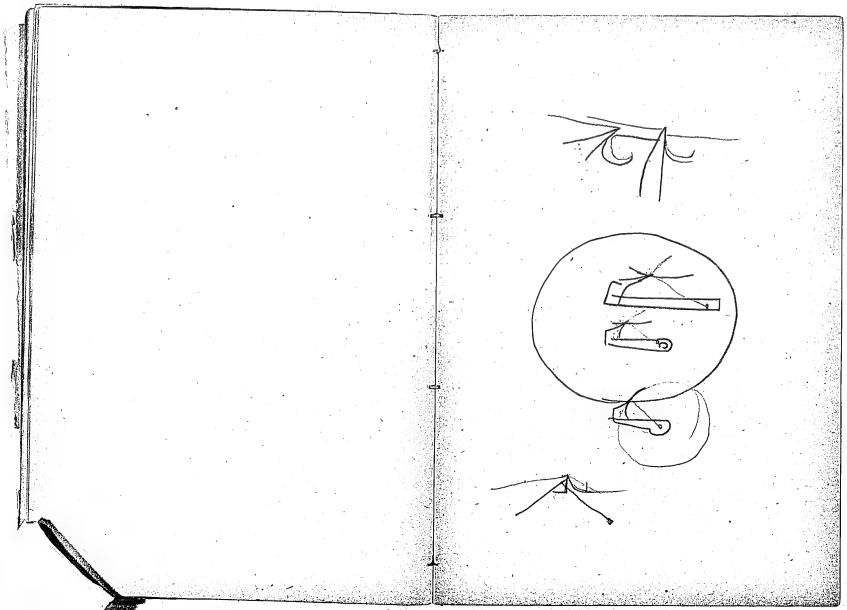

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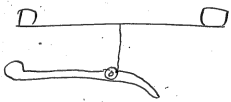

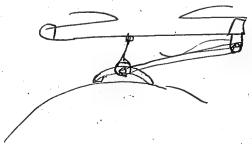

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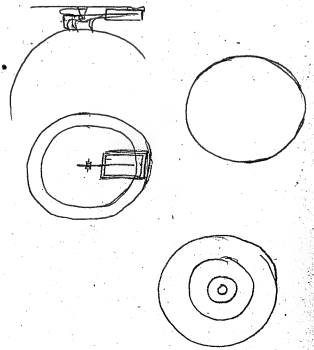

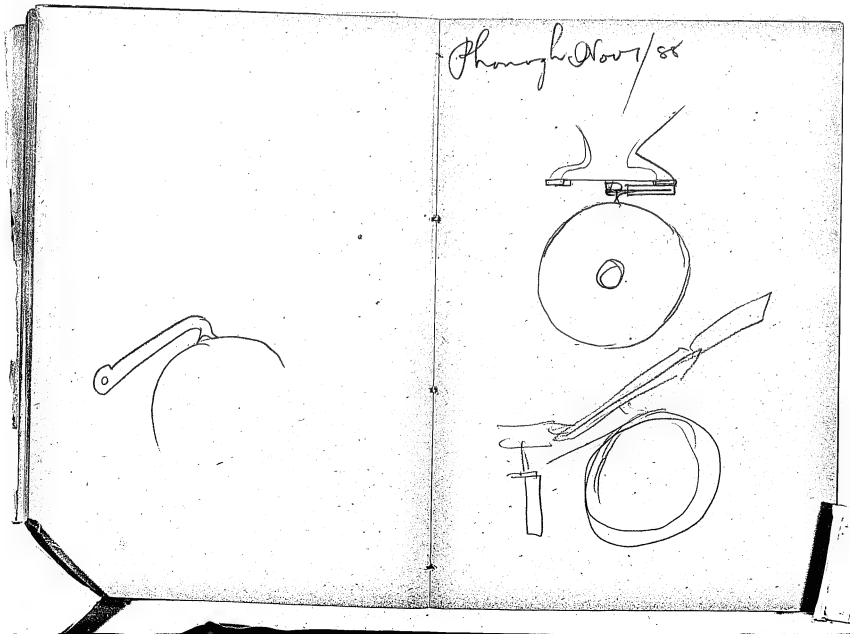
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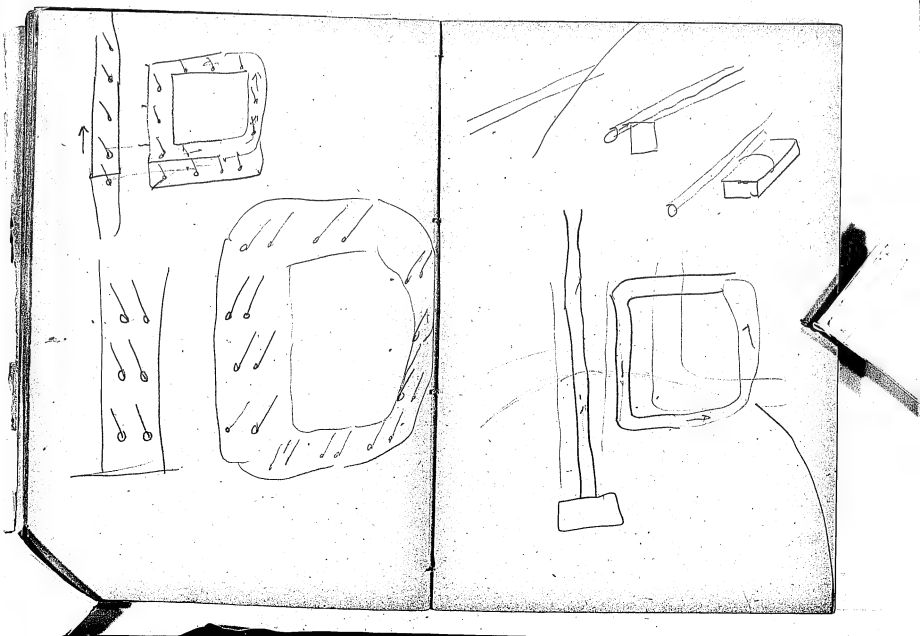
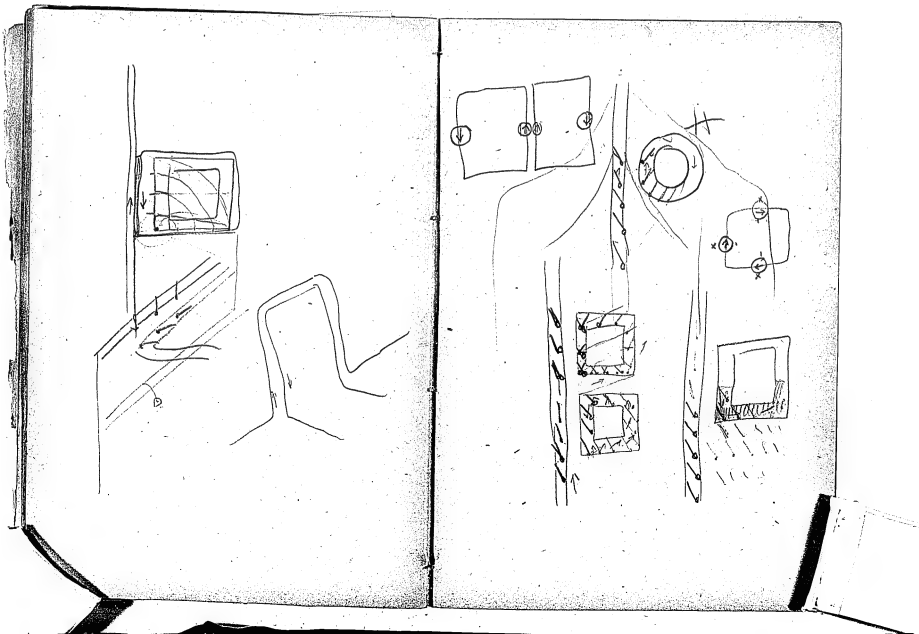
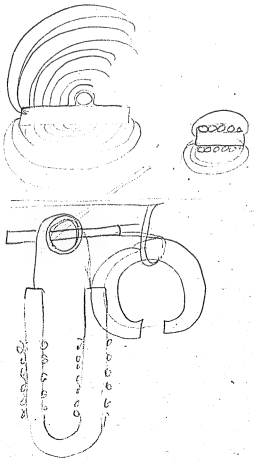
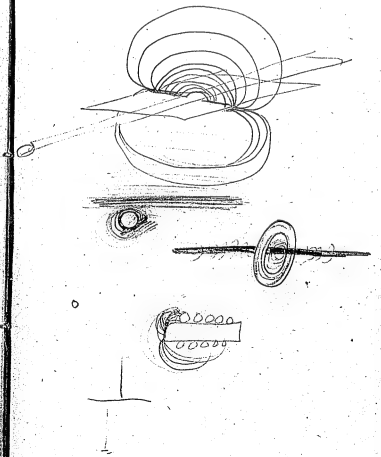




Iron Insulator of Cu & Stress





Iron is a non conductor of Electric stress

In favor -

1 Permanant magnets need only be hardened on the surface

2 Permanant Mags are more powerful the more you laminate them,

3 As Electric stress will take the ~~short~~ path of least resistance the Stronger magnetism of the Edges is accounted for in a straight magnet.

4 - If a piece of straight iron only deforms the Circular stress in a wire - then the above theory is wrong but if a new system is impressed it is only apparant & not real and the theory is correct.

5 If ~~saturation~~ an insulator to stress then the Surface is the seat of activity then loss of stress will on concentration follow a Curve similar to the rate of radiation of Energy in a filament when raised higher and higher

6 If an insulator & stress a surface action skin deep. The focault Currents heat ~~is~~ mainly takes place on the surface of a solid magnet any internal heat is due to Conduction,

7 ~~If an insulator a small wire of iron acting as a magnet should expand & contract in the iron than a large one. (2) Expansion will diminish with the~~

Expansion & contraction due to magnetism could take place in the skin

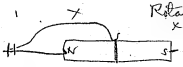
8 The iron displaces the Ether & produce a concentration of the amount displaced on its surface, (1) there is an Ether pressure on its surface the same as if it was made to displace water, there would be a water pressure on it if suspended in the ocean, Other matter does not displace Ether, work must be done by the Current to displace this Ether when normal ~~the~~ no more Current will produce any further Effect, the iron according to regular theory would be called saturated,

All matter displaces Ether to some extent, Bismuth the least,

Light should be effected if Ether is Concd on the surface of magnet,

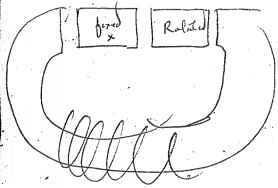
Gordon Kerr Exp'mt closed Mag Ckt good —

Conversely powerful beam light falling on a portion of a closed ring magnetized should give an induced Current

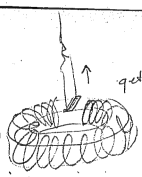


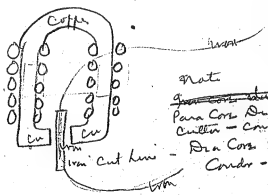
Rotate Mag gives Current X stands still. Lines rotate with magnet.

with any ~~twist~~ of lines take place in this gas suppose X very thin plate,



If iron displaces the Ether entirely and Copper very little how are we to account for Electric Conductivity of Copper being greater than iron perhaps Copper Condenses the Ether and make ~~a bow~~ the surface below normal this is bowing out but there being no work done or self induction in straight wire again the Wave or other motion Coming over is an independent action from the Ether the latter being only a state





In Cutting a uniform field the Current should be indep't of the speed if time was not an element but momentum must take place hence superimposition of rise of Current in proportion to speed

Two theories must be had

1st Iron condenses the Ether internally & reduces the Ether below normal Externally

2nd Copper-Bismuth etc - displaces the Ether and Concentrates it above normal Externally — hence only the surface of the Copper acts the medium ~~of~~ stress being absent internally —

or 3 } Vice Vera in both Cases,
4 }

Hence in 1. stress flows over the wire to the below normal until at normal when the magnet & the whole system is at normal or as it is said Saturated,

~~In a battery~~.

Work done is displacing Ether
this disturbance must be
propogated through Ether Heat
in heat must be given off
in proportion to the work done
in setting Ethers in Motion
If work is done by combn of O
with Zinc, the Ether of the Molecule
is displaced in combination
as the resultant Compound
has less Ether than before
This excess must be propogated
along matter which Ether
has less or more Ether than
Space or condenses ether
leaving on its boundry
surfaces less than normal

Ether -
with a wire the medium surrounding or
within the wire must be rotated if
Longitudinal motions only or Longitudinal
vortex it would not give directive force
to magnets.

any disturbance of the ether ~~can~~
~~only~~ has a fixed speed which
is say the Velocity of Light.
Every phenomenon of dynamic
Energy which uses Ether as
a medium for propogation
must necessarily have the
same speed, Heat Light
Elec Mag all must travel
at same speed, but this dont
imply they are same thing
Light is not a magnetic

phenomenon simply because Magnetism travels at same rate.

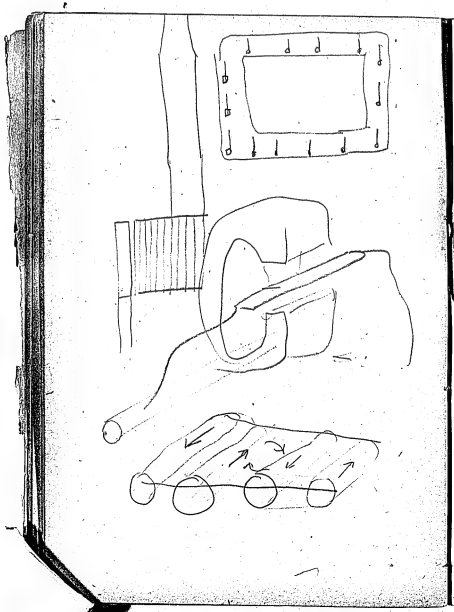
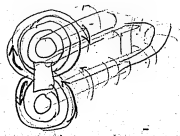
If Kerr Effect is simply due to particle of iron strongly magnetz at surface, as per Regular Theory + side Effect why shouldnt one get in on a mag weighing 1 oz saturated. It's because the Ether Condend on a surface is at the square of the size of the iron cylinder -

It may possibly be that Iron Condenses the Ether + Cu displaces it,

as it is essential for Explaining Attraction + repulsion of Cu wires with Current to suppose Ether outside

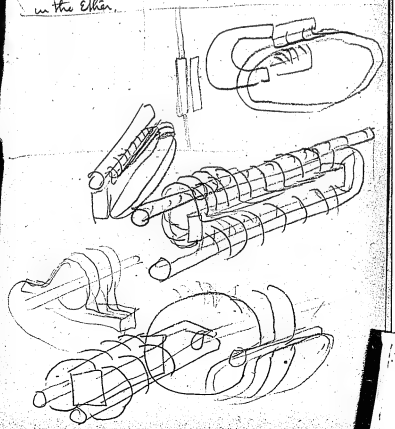
Magnetism - phenomenon on a wire etc is not Energy Conduction in a wire is independent of these phenomena, which are merely a incident or resultant for instance when a current is passing through Copper the lines around the wire ~~are~~ ~~fix~~ or a piece of iron in proximity are fixed. there are no Vortices moving But all is static. The Energy is transmitted by billiard ballaction

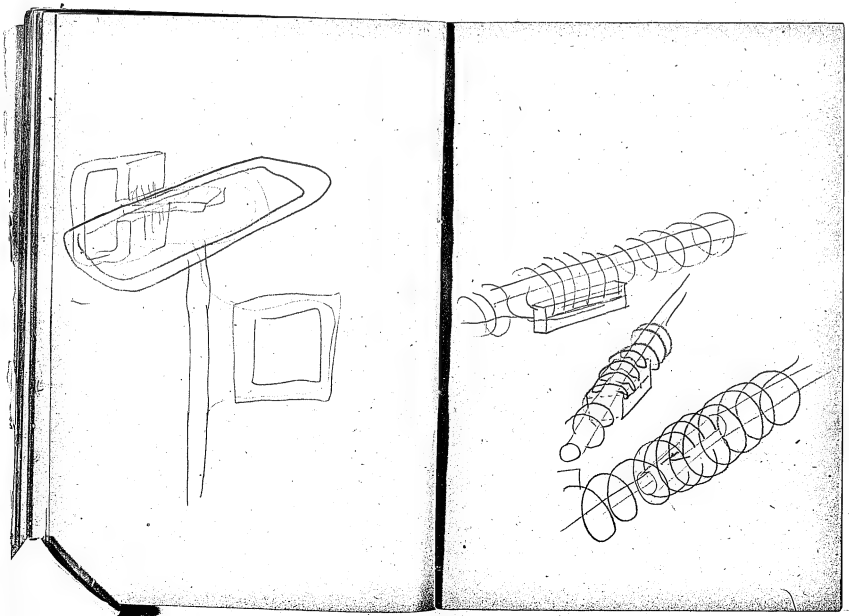
The stress is constant. The circles around a wire are not real but are made Evedent by iron filing. - The reason they appear a circles is that! The stress is propogated in ~~every direction~~ or on the surface of iron at right angles to that in the wire. This stress always takes the shortest route or path of least resistance. The path of least resistance in iron is at right angles - the reason why not requires so much Energy to stress it is because it ~~extra~~ has Ether waves condensed or rigid & requires more energy to produce a rise + fall of the stress

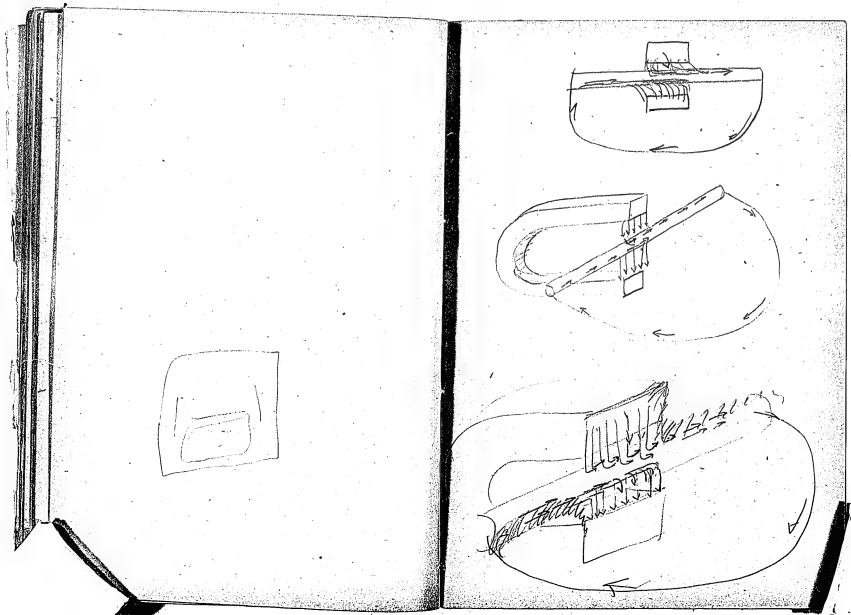



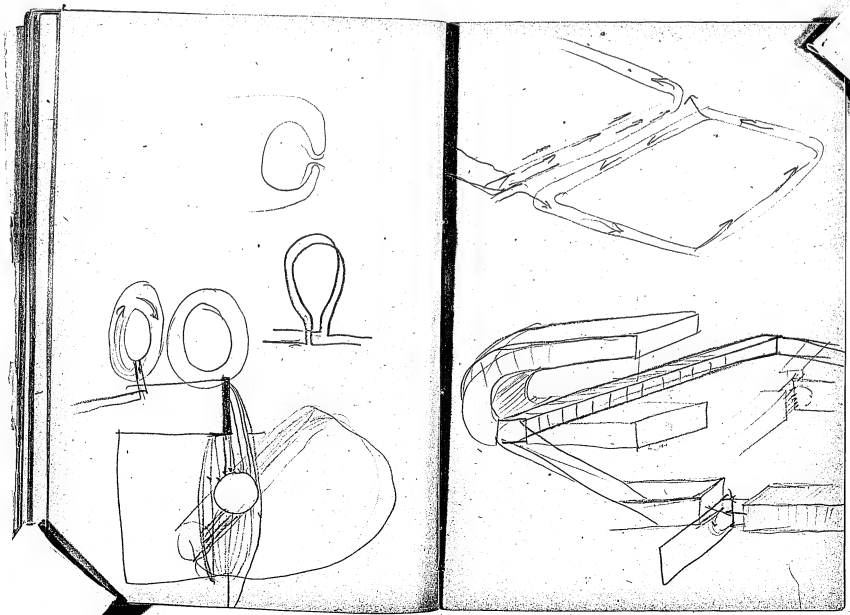
Each atom when [illegible] an envelope of Ether, or combination that gives heat, there is a diminution of the Ether

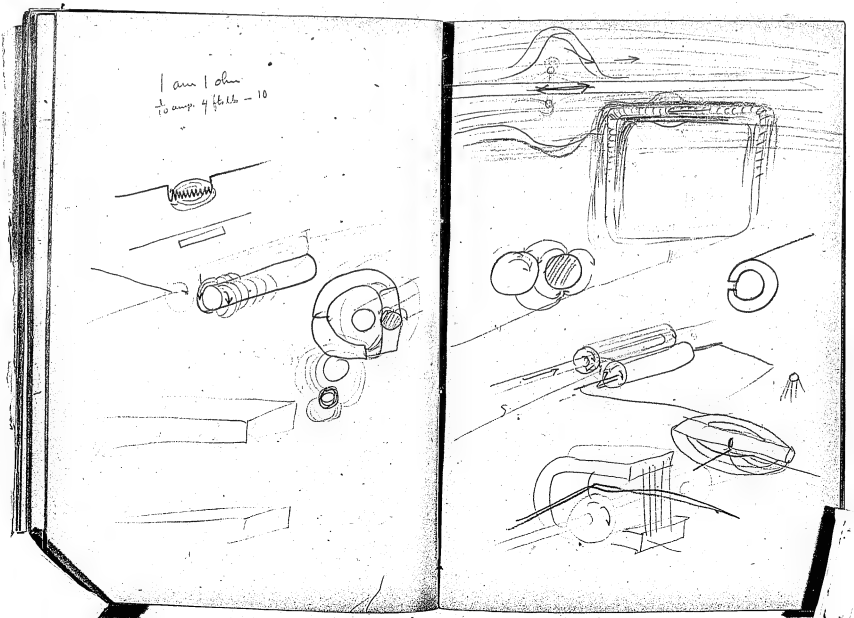
Two atoms combine & produce a rarefaction in the Ether.

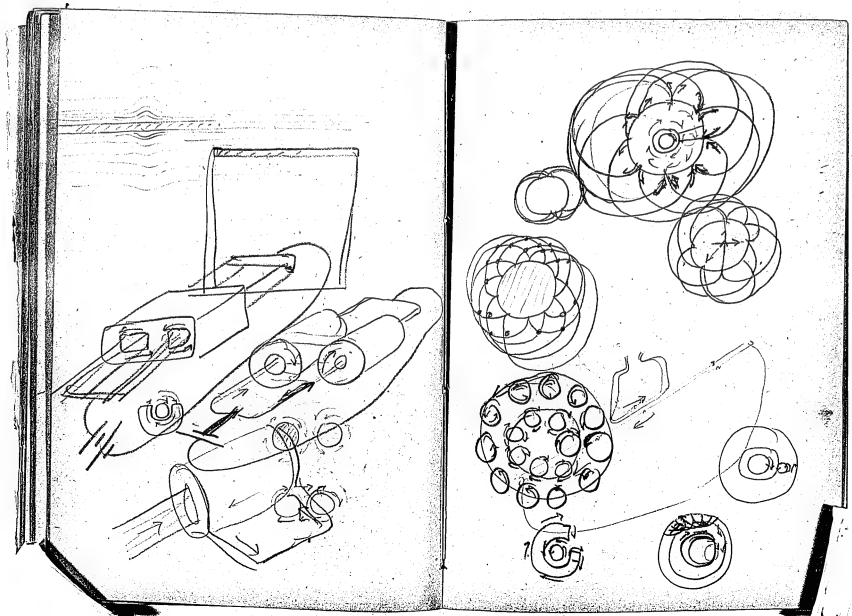


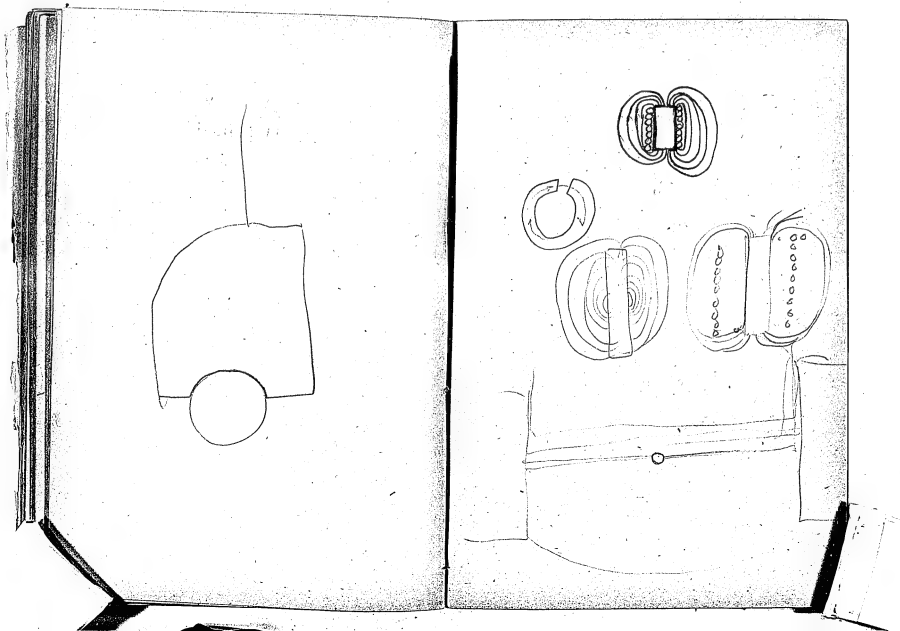


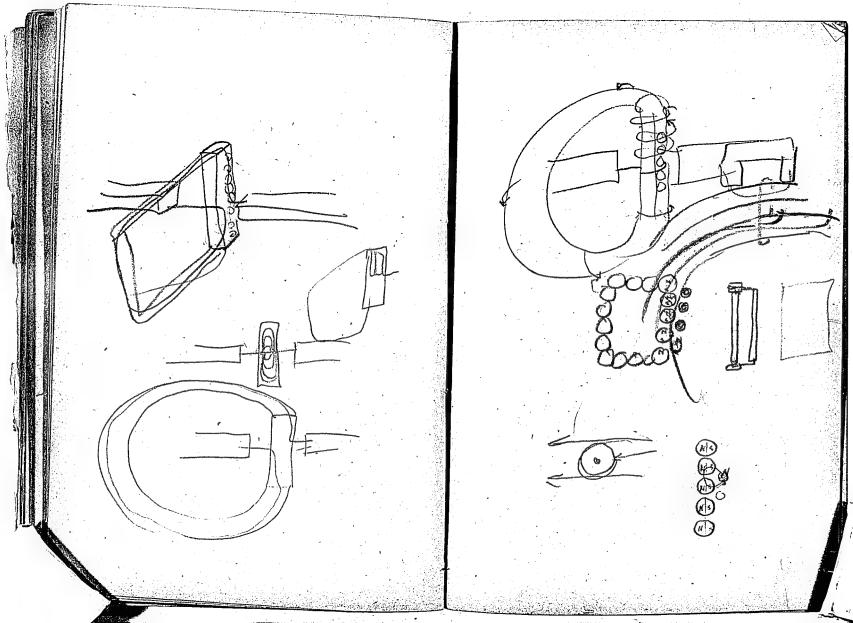


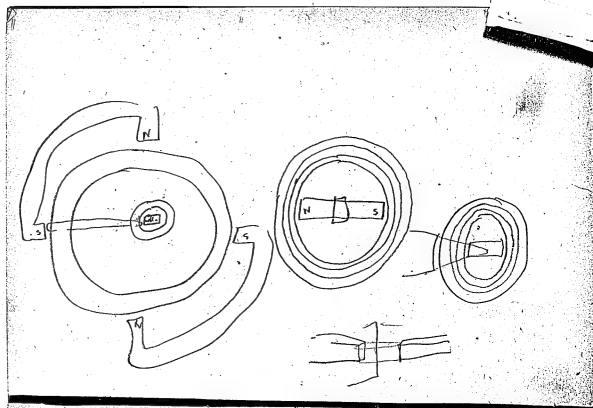



1 amp 1 ohm
10 amp. 4 volts – 10





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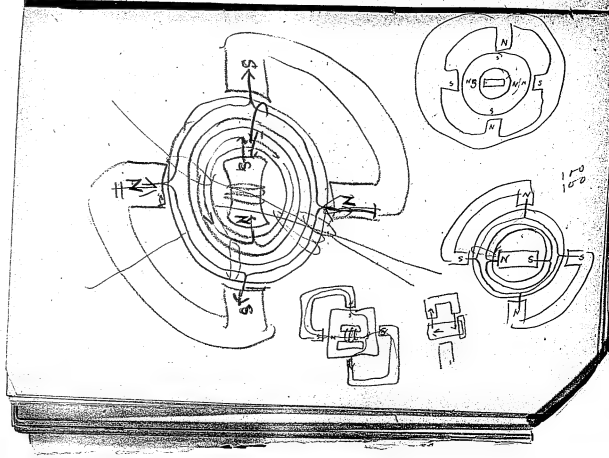
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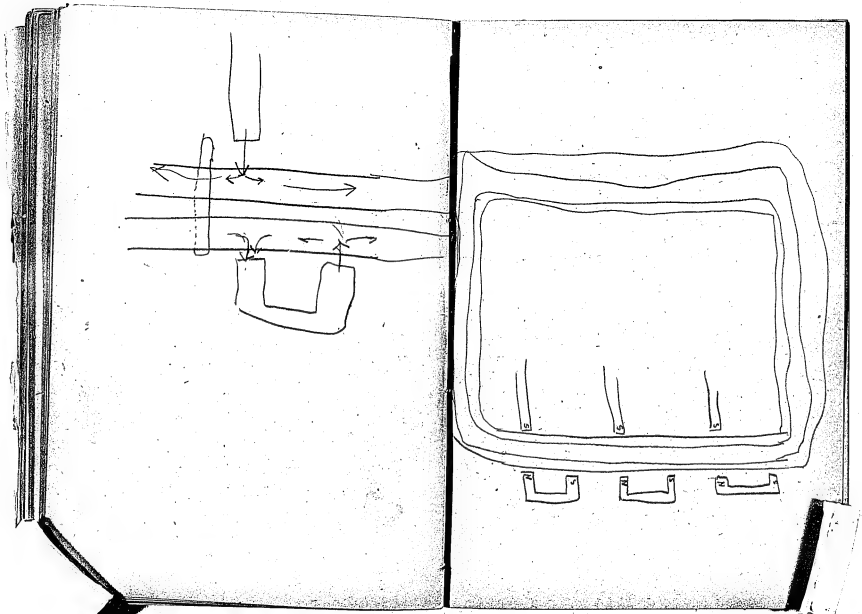

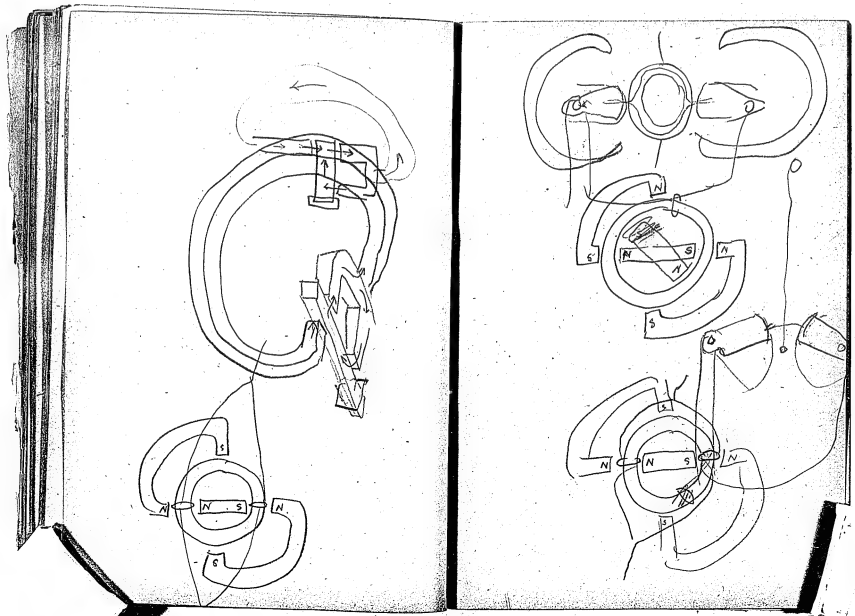
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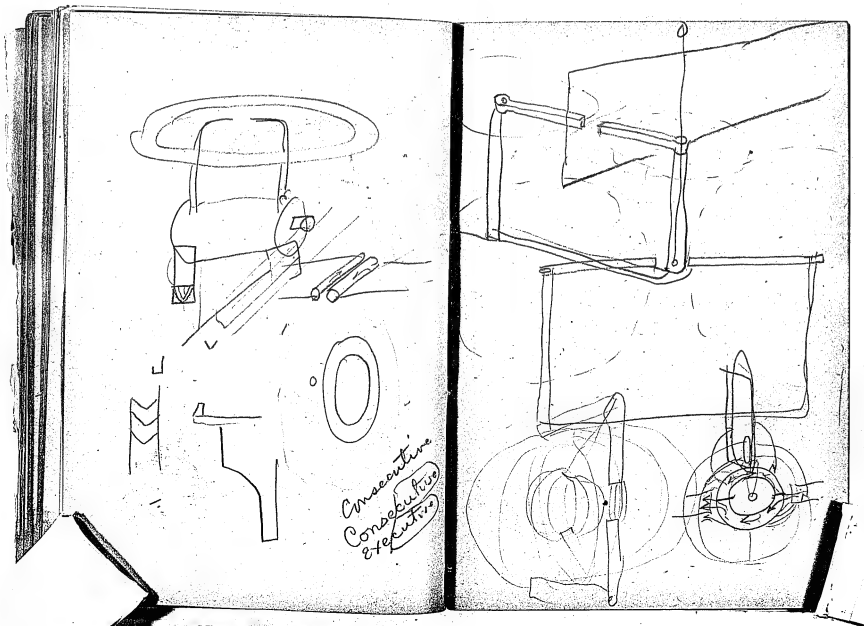
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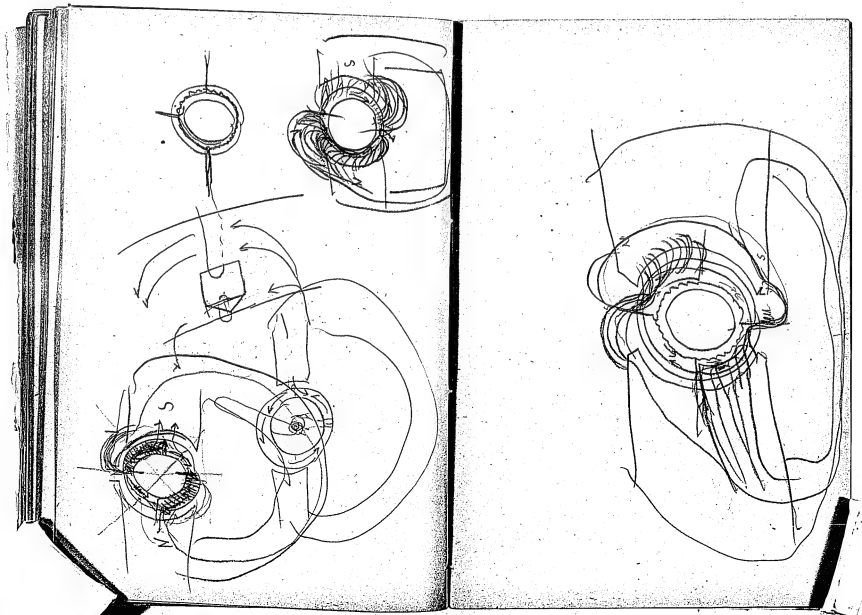

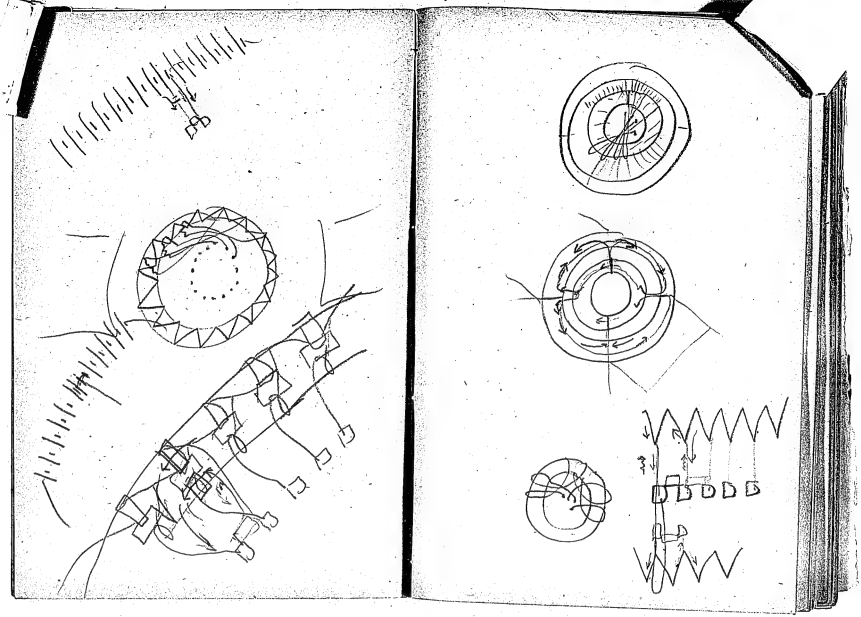

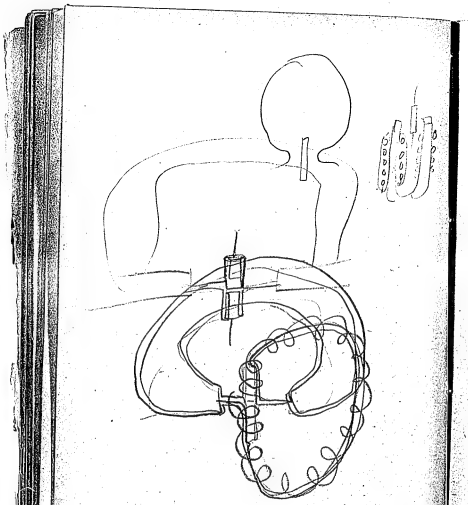

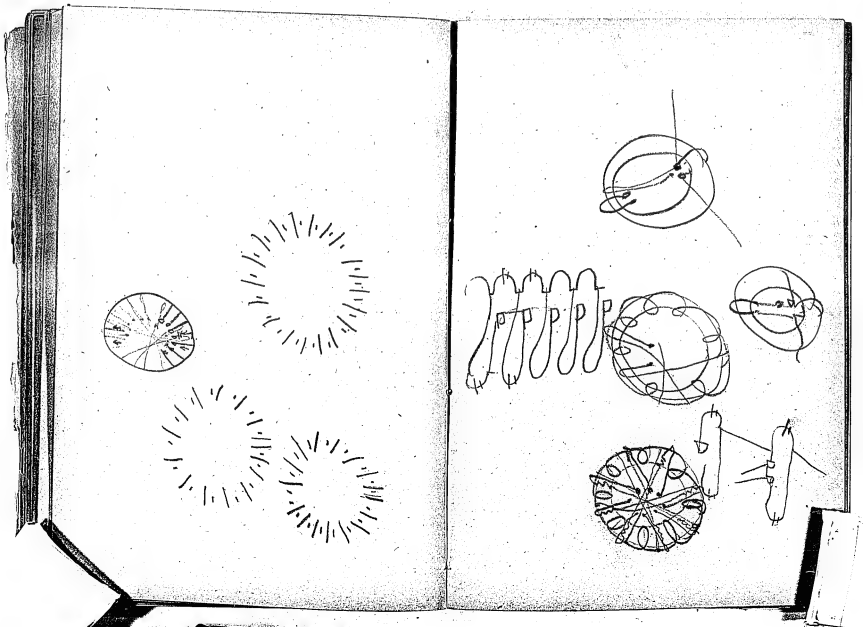

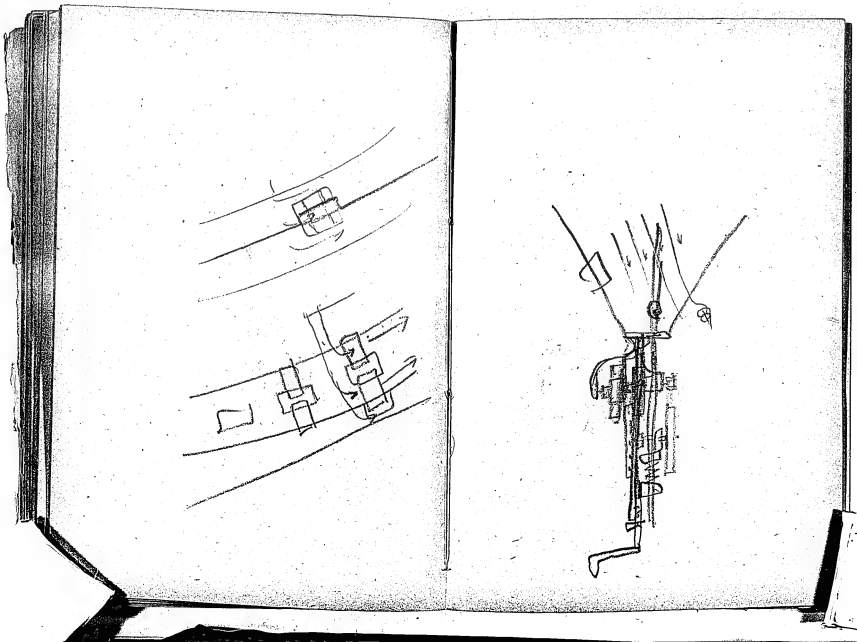

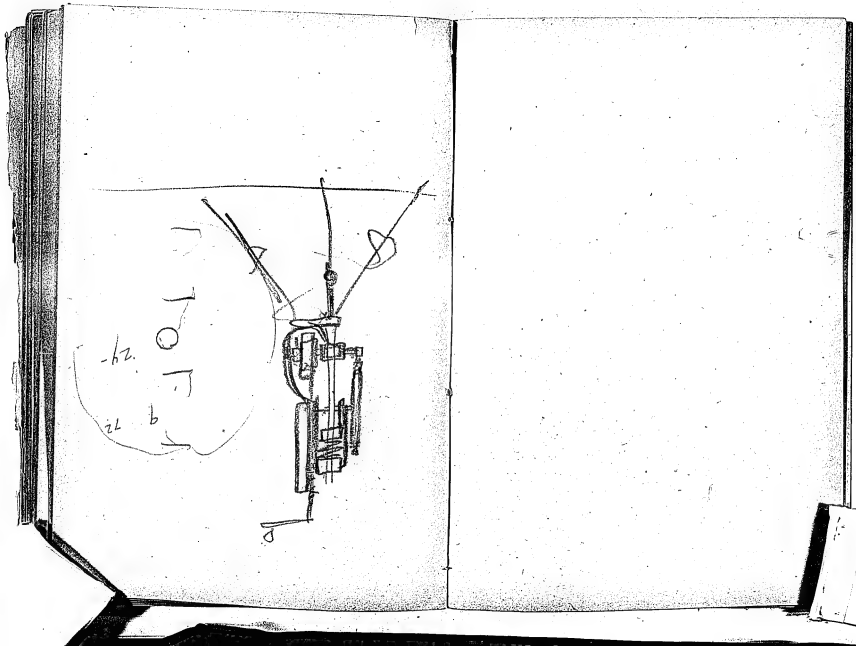

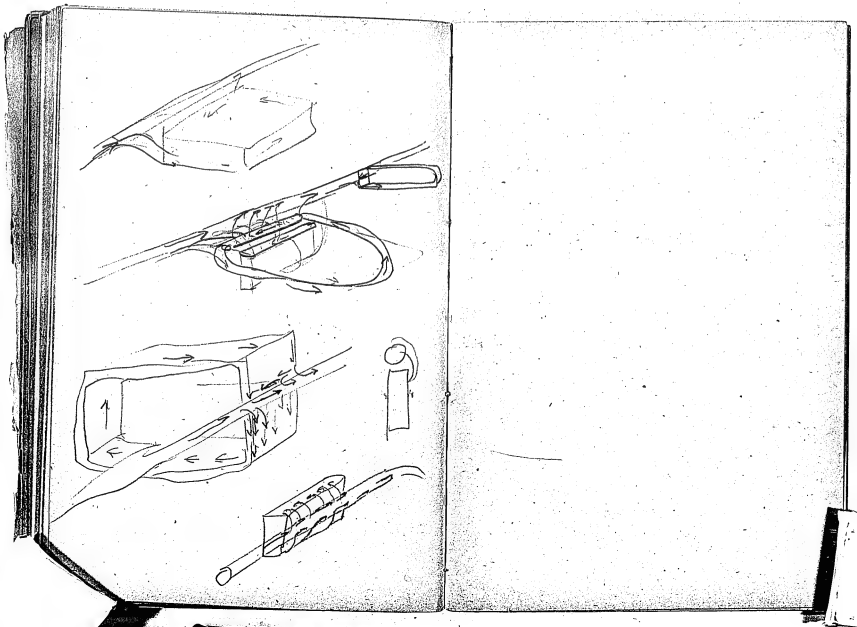

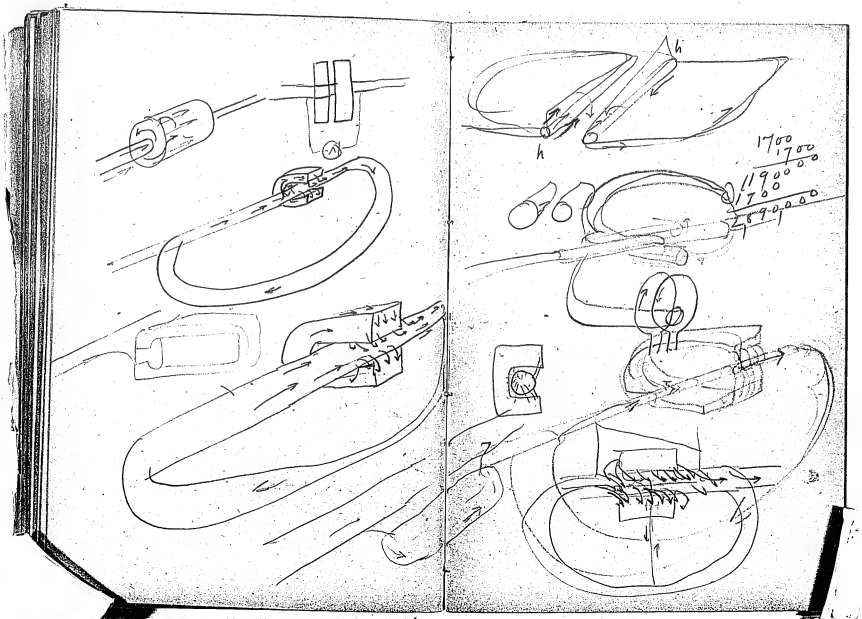
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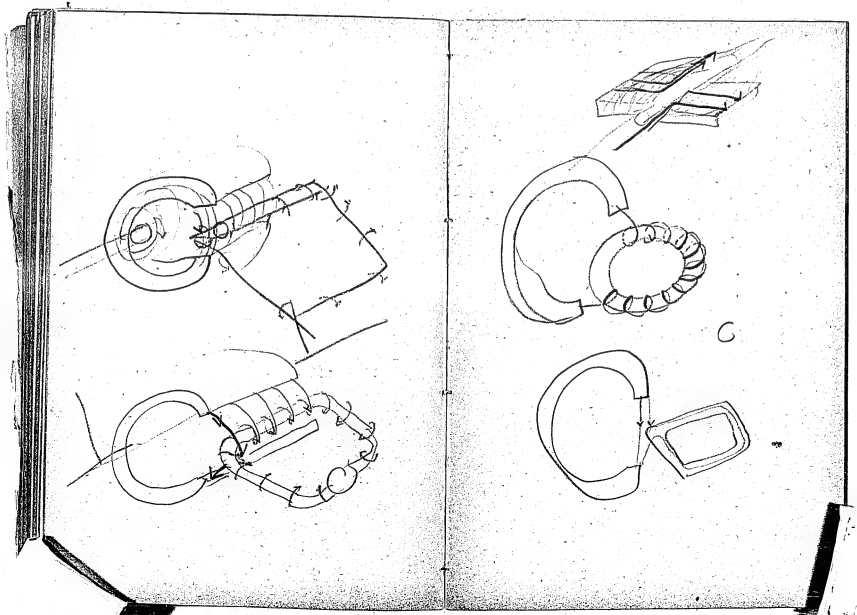

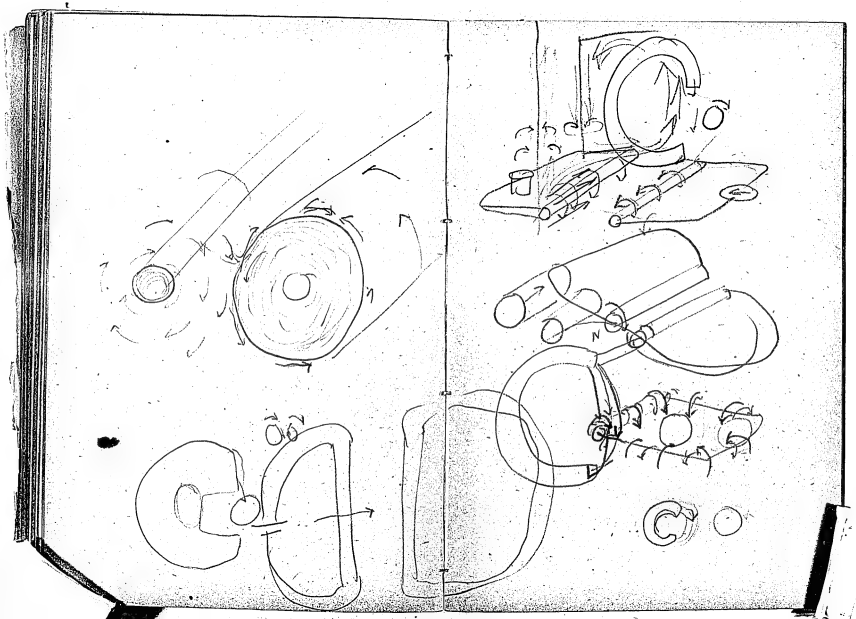

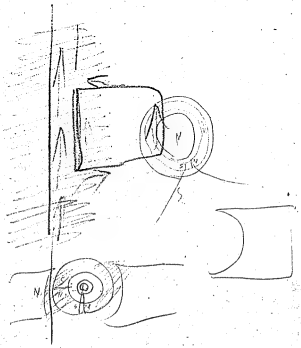

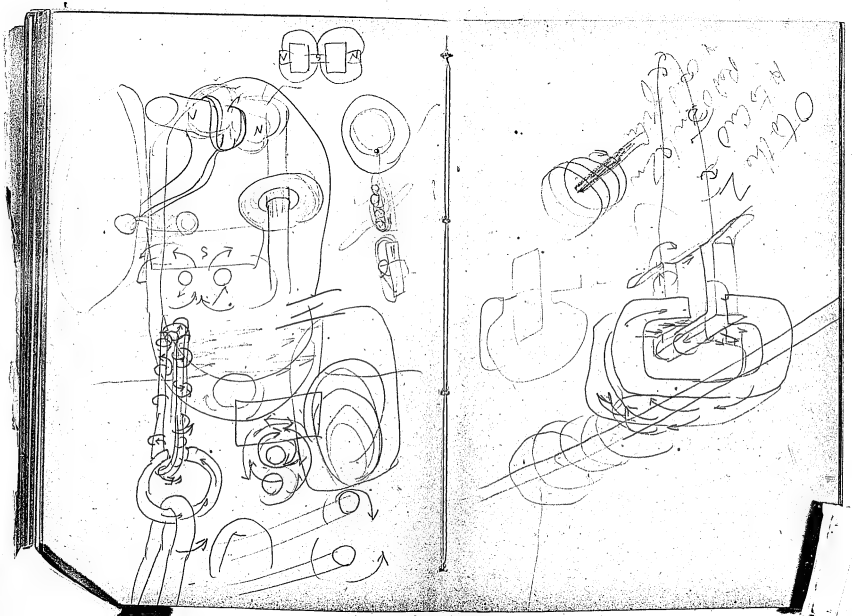

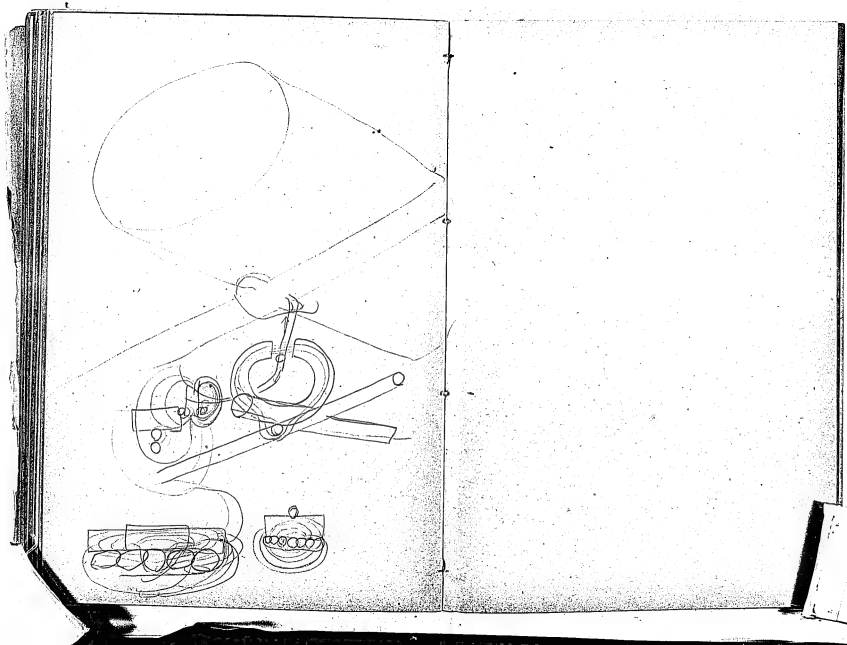

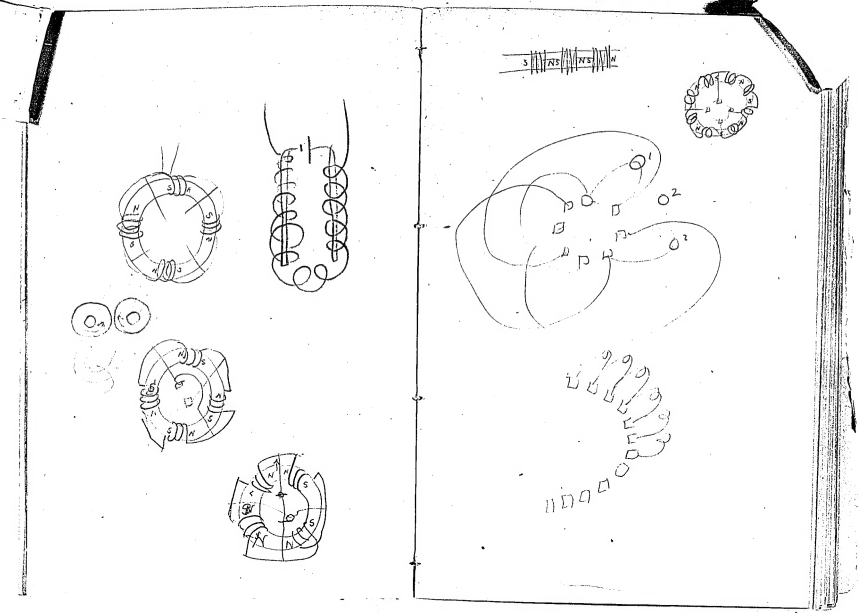

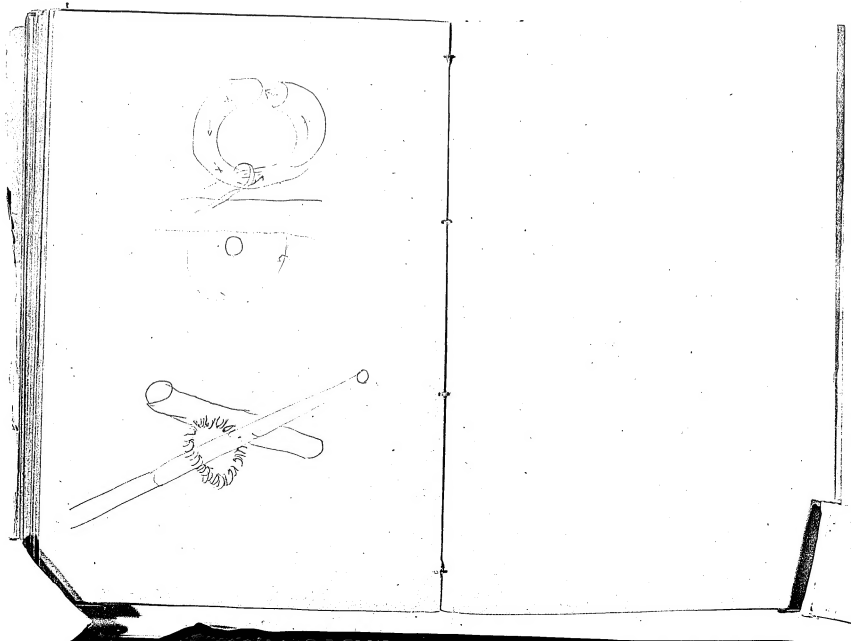

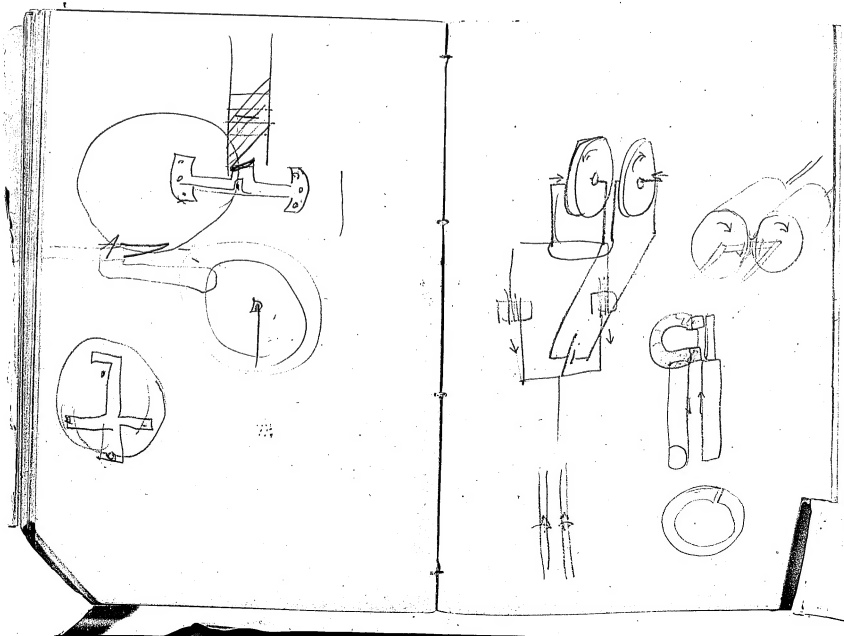

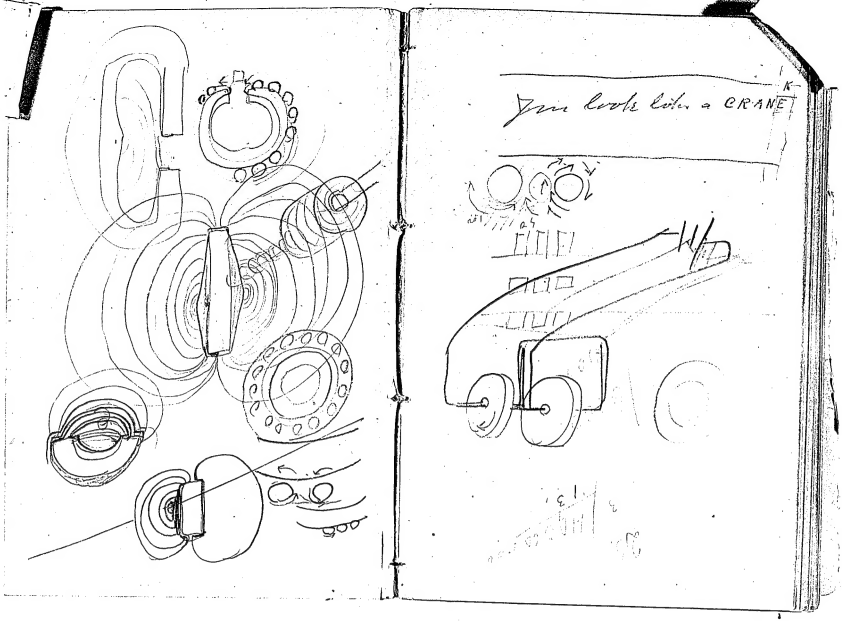
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